

# SEQUENCE LISTING

<110> Morton, Philip A et al.  
 <120> ANTIBODIES TO IGF-I RECEPTOR FOR THE TREATMENT OF CANCERS  
 <130> 01343/1  
 <150> 60/455,094  
 <151> 2003-03-14  
 <160> 157  
 <170> PatentIn version 3.2  
 <210> 1  
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 <213> artificial  
 <220>  
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Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
 100 105 110

Tyr Gly Met Asp Val Trp Gly Arg Gly Thr Met Val Thr Val Ser Ser  
 115 120 125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ser  
 130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala Ser Trp  
 165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr Gly Lys  
 180 185 190

Asn Lys Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
 195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
 210 215 220

Ala Asp Tyr Tyr Cys His Ser Arg Asp Ser Ser Gly Asn His Val Leu  
 225 230 235 240

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
 245 250

<210> 2  
 <211> 251  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 2

Gly Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
100 105 110

Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
115 120 125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ser  
130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Thr Asn Trp  
165 170 175

Phe Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Val Tyr Ala Lys  
180 185 190

Asn Lys Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His Val Val  
225 230 235 240

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
245 250

<210> 3  
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<212> PRT  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 3

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Asp Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
 100 105 110

Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
 115 120 125

Gly Gly Gly Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ser  
 130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160

Arg Ile Thr Cys Arg Gly Asp Ser Leu Arg Asn Tyr Tyr Ala Ser Trp  
 165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr Gly Lys  
 180 185 190

Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
 195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
 210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His Met Val  
 225 230 235 240

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
 245 250

<210> 4  
 <211> 251  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 4

Gly Val Gln Leu Val Glu Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
 100 105 110

Tyr Gly Met Asp Val Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ser  
 115 120 125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ser  
 130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala Ser Trp  
 165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr Gly Lys  
 180 185 190

Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
 195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
 210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His Val Val  
 225 230 235 240

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
 245 250

<210> 5  
 <211> 251  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 5

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
 100 105 110

Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
 115 120 125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ser

130

135

140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Thr Asn Trp  
 165 170 175

Phe Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Val Tyr Ala Lys  
 180 185 190

Asn Lys Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
 195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
 210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His Val Val  
 225 230 235 240

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
 245 250

<210> 6  
 <211> 251  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 6

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Pro Gly Tyr Asn Phe Phe Asn Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
100 105 110

Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
115 120 125

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ser  
130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala Ser Trp  
165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr Gly Lys  
180 185 190

Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His Val Val  
225 230 235 240

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
245 250

<210> 7  
<211> 245  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 7

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Arg Lys Pro Gly Ala  
1 5 10 15



Ser Val Lys Val Ser Cys Lys Thr Ser Gly Tyr Thr Phe Arg Asn Tyr  
 20 25 30

Asp Ile Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Arg Ile Ser Gly His Tyr Gly Asn Thr Asp His Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Phe Thr Met Thr Lys Asp Thr Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Glu Leu Arg Ser Leu Thr Phe Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Ser Gln Trp Asn Val Asp Tyr Trp Gly Arg Gly Thr Leu Val  
 100 105 110

Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly  
 115 120 125

Gly Gly Ser Ala Leu Asn Phe Met Leu Thr Gln Pro His Ser Val Ser  
 130 135 140

Glu Ser Pro Gly Lys Thr Val Thr Ile Ser Cys Thr Arg Ser Ser Gly  
 145 150 155 160

Ser Ile Ala Ser Asn Tyr Val Gln Trp Tyr Gln Gln Arg Pro Gly Ser  
 165 170 175

Ser Pro Thr Thr Val Ile Phe Glu Asp Asn Arg Arg Pro Ser Gly Val  
 180 185 190

Pro Asp Arg Phe Ser Gly Ser Ile Asp Thr Ser Ser Asn Ser Ala Ser  
 195 200 205

Leu Thr Ile Ser Gly Leu Lys Thr Glu Asp Glu Ala Asp Tyr Tyr Cys  
 210 215 220

Gln Ser Phe Asp Ser Thr Asn Leu Val Val Phe Gly Gly Gly Thr Lys  
 225 230 235 240

Val Thr Val Leu Gly  
 245

<210> 8  
 <211> 249  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 8

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg  
 1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asp Phe  
 20 25 30

Ala Met His Trp Val Arg Gln Ile Pro Gly Lys Gly Leu Glu Trp Leu  
 35 40 45

Ser Gly Leu Arg His Asp Gly Ser Thr Ala Tyr Tyr Ala Gly Ser Val  
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Arg Asn Thr Val Tyr  
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Thr Tyr Tyr Cys  
 85 90 95

Val Thr Gly Ser Gly Ser Ser Gly Pro His Ala Phe Pro Val Trp Gly  
 100 105 110

Lys Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly  
 115 120 125

Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Tyr Val Leu Thr Gln  
 130 135 140

Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln Arg Val Thr Ile Ser Cys  
 145 150 155 160

Ser Gly Ser Asn Ser Asn Ile Gly Thr Tyr Thr Val Asn Trp Phe Gln  
 165 170 175

Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu Ile Tyr Ser Asn Asn Gln  
 180 185 190

Arg Pro Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Lys Ser Gly Thr  
 195 200 205

Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln Ser Glu Asp Glu Ala Asp  
 210 215 220

Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu Asn Gly Pro Val Phe Gly  
 225 230 235 240

Gly Gly Thr Lys Val Thr Val Leu Gly  
 245

<210> 9  
 <211> 253  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 9

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
 1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
 20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
 35 40 45

Ser Ala Ile Ser Gly Ser Gly Gly Ser Thr Tyr Tyr Ala Asp Ser Val  
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr  
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Lys Gly Met Gly Tyr Tyr Gly Ser Gly Gly Tyr Tyr Pro Asp Asp  
 100 105 110

Ala Phe Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser Gly  
 115 120 125

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu  
 130 135 140

Ser Ser Glu Leu Thr Gln Asp Pro Asp Val Ser Met Ala Leu Gly Gln  
 145 150 155 160

Thr Val Thr Ile Ser Cys Arg Gly Asp Ser Leu Lys Arg Phe Tyr Ala  
 165 170 175

Ser Trp Tyr His Gln Lys Pro Gly Gln Ala Pro Val Leu Val Phe Tyr  
 180 185 190

Gly Lys Glu Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
 195 200 205

Asp Ser Gly Asp Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
 210 215 220

Asp Glu Gly Asp Tyr Tyr Cys His Thr Gln Asp Thr Ser Ala Arg Gln  
 225 230 235 240

Tyr Val Phe Gly Ser Gly Thr Lys Val Thr Val Leu Gly  
 245 250

<210> 10  
 <211> 251  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 10

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr

65

70

75 |

80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
100 105 110

Asp Ser Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly  
115 120 125

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Ser  
130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Asn Tyr Tyr Ala Ser Trp  
165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Met Phe Gly Lys  
180 185 190

Asn Asn Arg Pro Ser Glu Ile Pro Gly Arg Phe Ser Gly Ser Ser Ser  
195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Arg Asn Ser His Gln Trp Val  
225 230 235 240

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
245 250

<210> 11

<211> 245

<212> PRT

<213> artificial

<220>

<223> phage display generated antibody

<400> 11

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
 20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
 35 40 45

Ser Ala Ile Ser Gly Ser Gly Gly Ser Thr Tyr Tyr Ala Asp Ser Val  
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr  
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Ser Ser Pro Tyr Ser Ser Arg Trp Tyr Ser Phe Asp Pro Trp Gly  
 100 105 110

Gln Gly Thr Met Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly  
 115 120 125

Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Tyr Glu Leu Thr Gln  
 130 135 140

Pro Pro Ser Val Ser Val Ser Pro Gly Gln Thr Ala Thr Ile Thr Cys  
 145 150 155 160

Ser Gly Asp Asp Leu Gly Asn Lys Tyr Val Ser Trp Tyr Gln Gln Lys  
 165 170 175

Pro Gly Gln Ser Pro Val Leu Val Ile Tyr Gln Asp Thr Lys Arg Pro  
 180 185 190

Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser Asn Ser Gly Asn Ile Ala  
 195 200 205

Thr Leu Thr Ile Ser Gly Thr Gln Ala Val Asp Glu Ala Asp Tyr Tyr  
 210 215 220

Cys Gln Val Trp Asp Thr Gly Thr Val Val Phe Gly Gly Gly Thr Lys  
 225 230 235 240

Leu Thr Val Leu Gly

<210> 12  
 <211> 252  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 12

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
 100 105 110

Asp Ser Trp Gly Lys Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly  
 115 120 125

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Ser  
 130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala Ser Trp  
 165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr Gly Lys  
 180 185 190

Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
 195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
 210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His His Trp  
 225 230 235 240

Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly  
 245 250

<210> 13

<211> 253

<212> PRT

<213> artificial

<220>

<223> phage display generated antibody

<400> 13

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asp Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
 100 105 110

Asp Ser Trp Gly Arg Gly Thr Met Val Thr Val Ser Ser Gly Gly Gly  
 115 120 125



Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Ser  
 130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala Ser Trp  
 165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr Gly Lys  
 180 185 190

Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
 195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
 210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His Arg Asn  
 225 230 235 240

Trp Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly  
 245 250

<210> 14  
 <211> 247  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 14

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly  
 1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser His  
 20 25 30

Thr Met Asn Trp Val Arg Gln Ala Gln Gly Lys Gly Leu Glu Trp Val  
 35 40 45

Ser Ser Ile Ser Gly Ser Gly Arg Tyr Ile Tyr Tyr Ser Asp Ser Val  
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Ala Ala Lys Asn Ser Leu Tyr  
65 70 75 80

Leu Gln Met Asn Asn Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Thr Arg Ala Lys Phe Gly Asp Tyr Leu Phe Asp Ser Trp Gly Gln Gly  
100 105 110

Thr Leu Val Thr Val Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly  
115 120 125

Ser Gly Gly Gly Gly Ser Ala Leu Asn Phe Met Leu Thr Gln Pro His  
130 135 140

Ser Val Ser Gln Ser Pro Gly Lys Thr Val Thr Ile Ser Cys Thr Arg  
145 150 155 160

Ser Ser Gly Arg Ile Ala Ser Asn Phe Val Gln Trp Tyr Gln Gln Arg  
165 170 175

Pro Gly Ser Ala Pro Thr Thr Val Ile Tyr Glu Asp Asn Arg Arg Pro  
180 185 190

Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Ile Asp Ser Ser Ser Asn  
195 200 205

Ser Ala Ser Leu Thr Ile Ser Gly Leu Lys Thr Glu Asp Glu Ala Asp  
210 215 220

Tyr Tyr Cys Gln Ser Tyr Asp Ala Arg Tyr Gln Val Phe Gly Thr Gly  
225 230 235 240

Thr Lys Val Thr Val Leu Gly  
245

<210> 15  
<211> 251  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated antibody  
<400> 15

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly

1	5	10	15
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr	20	25	30
Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	35	40	45
Ser Ala Ile Ser Gly Ser Gly Gly Ser Thr Tyr Tyr Ala Asp Ser Val	50	55	60
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr	65	70	75
Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys	85	90	95
Ala Arg Ser Pro Val Pro Pro Trp Ala Asp Trp Tyr Tyr Phe Asp Tyr	100	105	110
Trp Gly Arg Gly Thr Met Val Thr Val Ser Ser Gly Gly Gly Gly Ser	115	120	125
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Gln Ala Val Leu Thr	130	135	140
Gln Pro Ser Ser Val Ser Gly Ala Pro Gly Gln Arg Val Thr Ile Ser	145	150	155
Cys Thr Gly Ser Arg Ser Asn Phe Gly Ala Gly Tyr Asp Val His Trp	165	170	175
Tyr Gln Gln Phe Pro Gly Thr Ala Pro Lys Leu Leu Ile Tyr Gly Asn	180	185	190
Thr Asn Arg Pro Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Arg Ser	195	200	205
Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu Gln Ala Glu Asp Glu	210	215	220
Ala Asp Tyr Tyr Cys Gln Ser Tyr Asp Ser Asn Leu Ser Gly Ser Val	225	230	235
			240

Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly  
 245 250

<210> 16  
 <211> 252  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 16

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
 100 105 110

Asp Ser Trp Gly Lys Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly  
 115 120 125

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Ser  
 130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Asn Tyr Tyr Ala Ser Trp  
 165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Leu Tyr Ser Lys

180                      185                      190  
 Asn Ser Arg Pro Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Ser Ser  
       195                      200                      205  
  
 Gly Thr Thr Ala Ser Leu Thr Ile Ser Gly Ala Gln Ala Glu Asp Glu  
       210                      215                      220  
  
 Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Thr Ser Gly Asp Leu Arg Trp  
       225                      230                      235                      240  
  
 Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
                              245                      250  
  
 <210> 17  
 <211> 251  
 <212> PRT  
 <213> artificial  
  
 <220>  
 <223> phage display generated antibody  
  
 <400> 17  
  
 Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
  1                      5                      10                      15  
  
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
                              20                      25                      30  
  
 Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
                              35                      40                      45  
  
 Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
       50                      55                      60  
  
 Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
  65                      70                      75                      80  
  
 Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
                              85                      90                      95  
  
 Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
                              100                      105                      110  
  
 Asp Ser Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly  
       115                      120                      125

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Ser  
 130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Asn Tyr Tyr Ala Ser Trp  
 165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Met Phe Gly Lys  
 180 185 190

Asn Asn Arg Pro Ser Glu Ile Pro Gly Arg Phe Ser Gly Ser Ser Ser  
 195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
 210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Asn Ser His Gln Trp Val  
 225 230 235 240

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
 245 250

<210> 18  
 <211> 253  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 18

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Ser Asp Lys Ser Thr Ser Thr Ala Tyr  
65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Ile Tyr Tyr Cys  
85 90 95

Ala Arg Glu Ile Phe Ser His Cys Ser Gly Gly Ser Cys Tyr Pro Phe  
100 105 110

Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Gly Gly Gly  
115 120 125

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Ser  
130 135 140

Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
145 150 155 160

Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala Ser Trp  
165 170 175

Tyr Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Ile Tyr Gly Arg  
180 185 190

Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
195 200 205

Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
210 215 220

Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Thr Asn His Gly Asn  
225 230 235 240

Trp Val Phe Gly Gly Gly Thr Gln Leu Thr Val Leu Ser  
245 250

<210> 19  
<211> 252  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 19

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15  
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30  
 Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45  
 Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60  
 Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
 65 70 75 80  
 Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95  
 Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
 100 105 110  
 Asp Ser Trp Gly Arg Gly Thr Met Val Thr Val Ser Ser Gly Gly Gly  
 115 120 125  
 Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ala Leu Ser Ser  
 130 135 140  
 Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln Thr Val  
 145 150 155 160  
 Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala Ser Trp  
 165 170 175  
 Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr Gly Lys  
 180 185 190  
 Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser Ser Ser  
 195 200 205  
 Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu Asp Glu  
 210 215 220  
 Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn Leu Asn Trp  
 225 230 235 240



Val Phe Gly Gly Gly Thr Gln Leu Thr Val Leu Ser  
245 250

<210> 20  
<211> 753  
<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 20  
gaagtgcagc tgggtgcagtc tggagcagag gtgaaaaagc ccggggagtc tctgacaatc 60  
tcctgtaagg gttctgggta caactttttc aactactgga tcggctgggt gcgccagatg 120  
cccgggaaag gcctggagtg gatggggatc atctatccta ctgactctga taccagatat 180  
agcccgctcct tccaaggcca ggtcaccatt tcagtcgaca agtccattag caccgcctat 240  
ctgcagtgga gcagcctgaa ggctccgac accgccatgt attactgtgc gagatccatt 300  
agatactgtc ctgggtggtag gtgctactcc gggtactacg gtatggacgt ctggggccgg 360  
gggacaatgg tcaccgtctc ttcaggtgga ggcggttcag gcggaggtgg cagcggcggg 420  
ggcggatcgt ctgagctgac tcaggaccct gctgtgtctg tggccttggg acagacagtc 480  
aggatcacat gccaaaggaga cagcctcaga agctattatg caagctggta ccagcagaag 540  
ccaggacagg cccctgtact tgtcatctat ggtaaaaata agcggccctc agggatccca 600  
gaccgattct ctggctccag ctcaggaaac acagcttcct tgaccatcac tggggctcag 660  
gcggaagatg aggtgacta ttactgtcat tcccgggaca gcagtggtaa ccatgtgctt 720  
ttcggcggag ggaccaagct gaccgtccta ggt 753

<210> 21  
<211> 753  
<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 21  
ggggtgcagc tgggtgcagtc tggggcagag gtgaaaaagc ccggggagtc tctgacaatc 60  
tcctgtaagg gttctggata caactttttc aactactgga tcggctgggt gcgccagatg 120  
cccgggaaag gcctggagtg gatggggatc atctatccta ctgactctga taccagatat 180  
agcccgctcct tccaaggcta ggtcaccatc tcagtcgaca agtccattag caccgcctat 240  
ctgcagtgga gcagcctgaa ggctccgac accgccatgt attactgtgc gagatccatt 300

agatactgtc ctggtggtag gtgctactcc ggttactacg gtatggacgt ctggggccag 360  
 gggacaatgg tcaccgtctc gagggtgga ggcggttcag gcggaggtgg cagcggcggt 420  
 ggcggatcgt ctgagttgac tcaggaccct gctgtgtctg tggccttggg acagacagtc 480  
 aggatcactt gccaaaggaga cagtctcaga agctattaca caaactgggt ccagcagaag 540  
 ccaggacagg cccctctact tgtcgtctat gctaaaaata agcggccctc agggatccca 600  
 gaccgattct ctggctccag ctcaggaaac acagcttctt tgaccatcac tggggctcag 660  
 gcggaagatg aggctgacta ttactgtaac tcccgggaca gcagtggtaa ccatgtggta 720  
 ttcggcggag ggaccaagct gaccgtccta ggt 753

<210> 22  
 <211> 753  
 <212> DNA  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 22  
 gaagtgcagc tgggtgcagtc tggggcagag gtgaaaaagc ccggggagtc tctgacaatc 60  
 tcctgcaagg gttctggata caactttttc aactactgga tcggctgggt gcgccagatg 120  
 cccgggaaag acctggagtg gatggggatc atctatccta ctgactctga taccagatat 180  
 agcccgtcct tccaaggcca ggtcacgatt tcagtcgaca agtccattag caccgcctat 240  
 ctgcagtgga gcagcctgaa ggcctccgac accgccatgt attactgtgc gagatccatt 300  
 agatactgtc ctggtggtag gtgctactcc ggttactacg gtatggacgt ctggggccag 360  
 gggacaatgg tcaccgtctc gagggtgga ggcagttcag gcggaggtgg cagcggcggt 420  
 ggcggatcgt ctgagctgac tcaggaccct gctgtgtctg tggccttggg acagacagtc 480  
 aggatcacat gccgaggaga cagcctcaga aactattatg caagctggta ccagcagaag 540  
 ccaggacagg cccctgtact tgtcatctat ggtaaaaaca accggccctc agggatccca 600  
 gaccgattct ctggctccag ctcaggaaac acagcttctt tgaccatcac tggggctcag 660  
 gcggaagatg aggctgacta ttactgtaac tcccgggaca gcagtggtaa ccatatggta 720  
 ttcggcggag ggaccaagct gaccgtccta ggt 753

<210> 23  
 <211> 753  
 <212> DNA  
 <213> artificial

<220>

<223> phage display generated antibody

<400> 23

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ggggtgcagc tgggtggagtc tggggcagag gtgaaaaagc ccggggagtc tctgacaatc      60
tcctgtaagg gttctggata caactttttc aactactgga tcggctgggt gcgccagatg      120
cccgggaaag gcctggagtg gatggggatc atctatccta ctgactctga taccagatat      180
agcccgtcct tccaaggcca ggtcaccatc tcagtcgaca agtccattag caccgcctat      240
ctgcagtgga gcagcctgaa ggcctccgac accgccatgt attactgtgc gagatccatt      300
agatactgtc ctgggtggtag gtgctactcc ggttactacg gtatggacgt ctggggcccg      360
ggaaccctgg tcaccgtctc ctcaggtgga ggcggttcag gcggaggtgg cagcggcggt      420
ggcggatcgt ctgagctgac tcaggaccct gctgtgtctg tggccttggg acagacagtc      480
aggatcacat gccaaaggaga cagcctcaga agctattatg caagctggta ccagcagaag      540
ccaggacagg ccctgtact tgtcatctat ggtaaaaaa accggccctc agggatccca      600
gaccgattct ctggctccag ctcaggaaac acagcttcct tgaccatcac tggggctcag      660
gcggaagatg aggctgacta ttactgtaac tcccgggaca gcagtggtaa ccatgtggta      720
ttcggcggag ggaccaagct gaccgtccta ggt                                     753
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<210> 24

<211> 753

<212> DNA

<213> artificial

<220>

<223> phage display generated antibody

<400> 24

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gaagtgcagc tgggtgcagtc tggagcagag gtgaaaaagc ccggggagtc tctgacaatc      60
tcctgtaagg gttctggata caactttttc aactactgga tcggctgggt gcgccagatg      120
cccgggaaag gcctggagtg gatggggatc atctatccta ctgactctga taccagatat      180
agcccgtcct tccaaggcca ggtcaccatt tcagtcgaca agtccattag caccgcctat      240
ctgcagtgga gcagcctgaa ggcctccgac accgccatgt attactgtgc gagatccatt      300
agatactgtc ctgggtggtag gtgctactcc ggttactacg gtatggacgt ctggggccag      360
ggcaccctgg tcaccgtctc ctcaggtgga ggcggttcag gcggaggtgg cagcggcggt      420
ggcggatcgt ctgagctgac tcaggaccct gctgtgtctg tggccttggg acagacagtc      480
aggatcactt gccaaaggaga cagtctcaga agctattaca caaactgggt ccagcagaag      540
ccaggacagg ccctctact tgtcgtctat gctaaaaata agcggccctc agggatccca      600
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gaccgattct ctggctccag ctcaggaaac acagcttcct tgaccatcac tggggctcag 660  
gcggaagatg aggctgacta ttactgtaac tcccgggaca gcagtggtaa ccatgtggtgta 720  
ttcggcggag ggaccaagct gaccgtccta ggt 753

<210> 25  
<211> 753  
<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 25  
gaggtgcagc tggtgcagtc tggggcagag gtgaaaaagc ccggggagtc tctgacaatc 60  
tcctgtaagg gtcttgata caactttttc aactactgga tcggctgggt gcgccagatg 120  
cccgggaaag gcctggagtg gatggggatc atctatccta ctgactctga taccagatat 180  
agcccgtcct tccaaggcca ggtcaccatc tcagtcgaca agtccattag caccgcctat 240  
ctgcagtgga gcagcctgaa ggctccgac accgccatgt attactgtgc gagatccatt 300  
agatactgtc ctggtggtag gtgctactcc ggttactacg gtatggacgt ctggggccaa 360  
ggaaccatgg tcacggtctc ctcagggtgga ggcggttcag gcggaggtgg cagcggcggt 420  
ggcggatcgt ctgagctgac tcaggaccct gctgtgtctg tggccttggg acagacggtc 480  
aggatcacat gccaaaggaga cagcctcaga agctattatg caagctggta ccagcagaag 540  
ccaggacagg ccctgtact tgtcatctat ggtaaaaaca accggccctc agggatccca 600  
gaccgattct ctggctccag ctcaggaaac acagcttcct tgaccatcac tggggctcag 660  
gcggaagatg aggctgacta ttactgtaac tcccgggaca gcagtggtaa ccatgtggtgta 720  
ttcggcggag ggaccaagct gaccgtccta ggt 753

<210> 26  
<211> 735  
<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 26  
caggtccagc tggtgcagtc tggggctgaa gtgaggaagc ctggggcctc agtgaaggtc 60  
tcctgcaaga cttcaggtta caccttttagg aactatgata tcaactgggt gcgacaggcc 120  
cctggacaag ggcttgagtg gatgggaagg atcagtggtc actatggcaa cacagaccat 180

gcacagaaat tccagggcag attcaccatg accaaagaca catccacgag cacagcctac 240  
atggaactga ggagcctgac atttgacgac acggccgtat attactgtgc gagaagtcag 300  
tggaacgttg actactgggg ccgaggaacc ctggtcaccg tctcgagtgg aggcggcggt 360  
tcaggcggag gtggctctgg cgggtggcga agtgcactta attttatgct gactcagccc 420  
cactctgtgt cggagtctcc ggggaagacg gtgaccatct cctgcacccg cagcagtggc 480  
agcattgcta gcaattatgt gcagtggtag cagcagcgcc cgggcagttc ccccaccact 540  
gtgatctttg aagataaccg aagaccctct ggggtccctg atcgggttttc tggctccatc 600  
gacacctcct ccaactctgc ctccctcacc atctctggac tgaagactga ggacgaggct 660  
gactactact gtcagtcttt tgatagcacc aatcttgtgg tggtcggcgg agggaccaag 720  
gtcacctgcc taggt 735

<210> 27  
<211> 774  
<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 27  
gaggtgcagc tgggtggagtc tgggggaggc gtgggtccagc ctgggaggtc cctgagactc 60  
tcctgtgcag cgtctggctt cactttcagt gattttgcca tgcactgggt ccgccagatt 120  
ccaggcaagg ggctggagtg gctgtcagga ttacggcatg atggaagtac ggcttactat 180  
gcagggtccg tgaagggccg cttcaccatc tccagagaca attccaggaa tactgtatat 240  
ctccaaatga atagcctgag ggccgaggac acggctacgt attactgtgt gacagggagc 300  
ggtagctccg gtccccacgc ttttcctgtc tggggcaaag gcaccctggc caccgtctcg 360  
agtggaggcg gcggttcagg cggaggtggc tctggcgggt gcggaagtgc actttcctat 420  
gtgctgactc agccaccctc agcgtctggg acccccgggc agagggtcac catctcttgt 480  
tctggaagca actccaacat cgggacttat actgtaaatt ggttcagca gctcccagga 540  
acggccccca aactcctcat ctacagtaat aatcagcggc cctcaggggt ccctgaccga 600  
ttctctggct ccaagtctgg cacctcagcc tccctggcca tcagtgggct ccagtctgag 660  
gatgaggctg attattactg tgcagcaatg ggatgacagc ctgaatggtc cggttttcgg 720  
cggagggacc aagggtaccg tcctaggtgc ggccgcacat catcatcacc atca 774

<210> 28  
<211> 759

<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 28  
gaggtgcagc tggtggagtc tgggggaggc ttggtacagc ctgggggggctc cctgagactc 60  
tcctgtgcag cctctggatt caccttttagc agctatgcca tgagctgggt ccgccaggct 120  
ccagggaagg ggctggagtg ggtctcagct attagtggta gtggtggtag cacatactac 180  
gcagactccg tgaagggccg gttcaccatc tccagagaca attccaagaa cacgctgtat 240  
ctgcaaatac acagcctgag agccgaggac acggccgtgt attactgtgc gaaaggaatg 300  
ggatactatg gttcgggagg ttattatccg gatgatgctt ttgatgtctg gggccagggg 360  
acaatggtea ccgtctcgag tggaggcggc gggtcaggcg gaggtggctc tggcggtggc 420  
ggaagtgcac tttcttctga gctgactcag gaccctgatg tgtctatggc cttgggtcag 480  
acagtcacca tttcatgccg aggagacagc ctcaaaagat tttatgcaag ttggtatcac 540  
cagaagccag gacaggcccc tgtccttgct ttctatggta aagaaaatcg gccctcaggg 600  
atcccagacc ggttctctgg ctccgactct ggagacacag cctccttgac catcactggg 660  
gctcaggcgg aagatgaggg tgactattac tgtcacactc aggacaccag tgctcgccaa 720  
tatgtcttcg ggagtgggac caaggtcacc gtcctaggt 759

<210> 29  
<211> 753  
<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 29  
gaggtgcagc tggtgcagtc gggggctgag gtgaagaagc ctggggcctc agtgaaggtc 60  
tcctgtaagg cctctgggta ctcttttacc aactatggct tcaactgggt gcgacaggcc 120  
cctggacagg gacttgagtg gatgggatgg atcagccctt acactgggta cacaaattat 180  
gcacagaagt tccagggcag agtcaccatg accacagata aatccacgag cacagcctac 240  
atggacctga ggagtctgag atctgacgac accgccgttt attactgtgc gagagagatt 300  
ttttctcatt gtactggtgg cagttgctac ctttttgact cctggggccg aggcaccctg 360  
gtcaccgtct cgagtggagg cggcggttca ggcggagggt gctctggcgg tggcggaagt 420  
gcactttctt ctgagctgac tcaggaccct gctgtgtctg tggccttggg acagacagtc 480

aggatcacat gcccaaggaga cagcctcaga aactactatg caagttggta ccagcagaag 540  
ccagggcagg cccctctcct tgtcatgttt ggtaagaaca accggccctc agagatccca 600  
ggccgattct ctggctccag ttcgggaaac acagcttcct tgaccatcac tggggctcag 660  
gcggaagatg aggctgacta ttactgtaat tctcgagaca gaaacagtca tcaatgggtg 720  
ttcggcggag ggaccaagct gaccgtccta ggt 753

<210> 30  
<211> 735  
<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 30  
gaggtgcagc tggtggagtc tgggggaggc ttggtacagc ctgggggggc cctgagactc 60  
tcctgtgcag cctctggatt cacctttagc agctatgccca tgagctgggt ccgccaggct 120  
ccaggaagg ggctggagtg ggtctcagct attagtggta gtggtggtag cacatactac 180  
gcagactccg tgaagggccg gttcaccatc tccagagaca attccaagaa cacgctgtat 240  
ctgcaaatac acagcctgag agccgaggac acggccgtgt attactgtgc gagtagtccc 300  
tatagcagca ggtggtactc gttcgacccc tggggccaag ggacaatggc caccgtctcg 360  
agtggaggcg gcggttcagg cggagggtggc tctggcggtg gcggaagtgc actttcctat 420  
gagctgactc agccaccctc agtgtccgtg tccccaggac agacagccac catcacctgc 480  
tctggagatg acttggggaa taaatatgtt tcgtggtatc aacagaagcc aggccagtcc 540  
cctgtgctgg tcatttatca agataccaag cggccctcag ggatccctga gcgattctct 600  
ggctccaact ctgggaacat agccactctg accatcagcg ggacccaggc tgtggatgag 660  
gctgactatt attgtcaggt gtgggacacc ggcactgtgg ttttcggcgg cgggaccaag 720  
ctgaccgtcc taggt 735

<210> 31  
<211> 756  
<212> DNA  
<213> artificial

<220>  
<223> phage display generated antibody

<400> 31  
caggtccagc tggtgcagtc tggggctgag gtgaagaagc ctggggcctc agtgaaggtc 60  
tcctgtaagg cctctgggta ctcttttacc aactatggtc tcaactgggt gcgacaggcc 120

cctggacagg gacttgagtg gatgggatgg atcagccctt aactgggta cacaattat	180
gcacagaagt tccagggcag agtcaccatg accacagata aatccacgag cacagcctac	240
atggacctga ggagtctgag atctgacgac accgccgttt attactgtgc gagagagatt	300
ttttctcatt gtactggtgg cagttgctac ccttttgact cctggggcaa aggaacctg	360
gtcaccgtct cgagtggagg cggcggttca ggcggaggtg gctctggcgg tggcggaagt	420
gcactttctt ctgagctgac tcaggaccct gctgtgtctg tggccttggg acagacagtc	480
aggatcacat gccaaaggaga cagcctcaga agctattatg caagctggta ccagcagaag	540
ccaggacagg cccctgtact tgtcatctat ggtaaaaaca accggccctc agggatccca	600
gaccgattct ctggctccag ctcaggaaac acagcttcct tgaccatcac tggggctcag	660
gcggaagatg aggctgacta ttactgtaac tcccgggaca gcagtggtaa ccatcattgg	720
gtgttcggcg gagggaccaa ggtcaccgtc ctaggt	756

<210> 32  
 <211> 759  
 <212> DNA  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 32	
gaggtccagc tgggtgcagtc tggggctgag gtgaagaagc ctggggcctc agtgaaggtc	60
tcctgtaagg cctctgggta ctcttttacc aactatggtc tcgactgggt gcgacaggcc	120
cctggacagg gacttgagtg gatgggatgg atcagccctt aactgggta cacaattat	180
gcacagaagt tccagggcag agtcaccatg accacagata aatccacgag cacagcctac	240
atggacctga ggagtctgag atctgacgac accgccgttt attactgtgc gagagagatt	300
ttttctcatt gtactggtgg cagttgctac ccttttgact cctggggcag agggacaatg	360
gtcaccgtct cgagtggagg cggcggttca ggcggaggtg gctctggcgg tggcggaagt	420
gcactttctt ctgagctgac tcaggaccct gctgtgtctg tggccttggg acagacagtc	480
aggatcacat gccaaaggaga cagcctcaga agctattatg caagctggta ccagcagaag	540
ccaggacagg cccctgtact tgtcatctat ggtaaaaaca accggccctc agggatccca	600
gaccgattct ctggctccag ctcaggaaac acagcttcct tgaccatcac tggggctcag	660
gcggaagatg aggctgacta ttactgtaac tcccgggaca gcagtggtaa ccatcggaat	720
tgggtgttcg gcggaggagc caaggtcacc gtcctaggt	759



<210> 33  
 <211> 741  
 <212> DNA  
 <213> artificial

<220>  
 <223> phage display generated antibody

<400> 33  
 caggtgcagc tgggtggagtc tggggggaggc ctggtcaagc ctgggggggtc cctgagactc 60  
 tcctgtgcag cctctggatt caccttcagc agccacacca tgaactgggt cgcaggct 120  
 caaggggaagg ggctggagtg ggtctcatcc attagtggta gtggtcgtta catttactat 180  
 tcagactcag tgaagggccg gttcaccatc tccagagacg ccgccaagaa ctctctgtat 240  
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 ggcggcggtt caggcggagg tggctctggc ggtggcgga gtgcacttaa ttttatgctg 420  
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agtcaccatg	acttcagata
aatccacgag	cacagcctac
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atctgacgac	acggccattt
attattgtgc	gagagagatt
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tagttgctac	ccttttgact
actggggcca	gggaaccctg
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cggcggttca	ggcggagggtg
gctctggcgg	tggcggaagt
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tcaggaccct	gctgtgtctg
tggccttggg	acagacagtc
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 <223> primer  
  
 <400> 104  
 gatcgatcgc gcgcactccg aggtccagct ggtgcagtct gg 42  
  
 <210> 105  
 <211> 34  
 <212> DNA  
 <213> artificial  
  
 <220>  
 <223> primer  
  
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 <212> DNA  
 <213> artificial  
  
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 <223> primer  
  
 <400> 106  
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 <210> 107

<211> 62  
<212> DNA  
<213> artificial

<220>  
<223> primer

<400> 107  
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cc 62

<210> 108  
<211> 128  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 108

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
100 105 110

Tyr Gly Met Asp Val Trp Gly Arg Gly Thr Met Val Thr Val Ser Ser  
115 120 125

<210> 109  
<211> 110  
<212> PRT  
<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 109

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala  
20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr  
35 40 45

Gly Lys Asn Lys Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys His Ser Arg Asp Ser Ser Gly Asn His  
85 90 95

Val Leu Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala  
100 105 110

<210> 110

<211> 128

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 110

Gly Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
50 55 60

Gln Gly Asx Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
100 105 110

Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
115 120 125

<210> 111

<211> 110

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 111

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Thr  
20 25 30

Asn Trp Phe Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Val Tyr  
35 40 45

Ala Lys Asn Lys Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His  
85 90 95

Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala  
100 105 110

<210> 112

<211> 128

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 112

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Asp Leu Glu Trp Met  
35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
100 105 110

Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
115 120 125

<210> 113

<211> 108

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 113

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
1 5 10 15

Thr Val Arg Ile Thr Cys Arg Gly Asp Ser Leu Arg Asn Tyr Tyr Ala  
20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr  
35 40 45

Gly Lys Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His  
85 90 95

Met Val Gly Gly Thr Lys Leu Thr Val Leu Gly Ala  
100 105

<210> 114

<211> 128

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 114

Gly Val Gln Leu Val Glu Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
100 105 110

Tyr Gly Met Asp Val Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ser  
115 120 125

<210> 115  
<211> 110  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 115

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala  
20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr  
35 40 45

Gly Lys Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His  
85 90 95

Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala  
100 105 110

<210> 116  
<211> 128  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 116

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Ser Gly Tyr Asn Phe Phe Asn Tyr  
20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
35 40 45



Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
100 105 110

Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
115 120 125

<210> 117  
<211> 108  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region  
<400> 117

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Thr  
20 25 30

Asn Trp Phe Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Val Tyr  
35 40 45

Ala Lys Asn Lys Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His  
85 90 95

Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu  
100 105

<210> 118  
 <211> 128  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 118

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15

Ser Leu Thr Ile Ser Cys Lys Gly Pro Gly Tyr Asn Phe Phe Asn Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Thr Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Val Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95

Ala Arg Ser Ile Arg Tyr Cys Pro Gly Gly Arg Cys Tyr Ser Gly Tyr  
 100 105 110

Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
 115 120 125

<210> 119  
 <211> 110  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 119

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
 1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala  
 20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr  
 35 40 45

Gly Lys Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
 50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
 65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His  
 85 90 95

Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala  
 100 105 110

<210> 120  
 <211> 116  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 120

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Arg Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Thr Ser Gly Tyr Thr Phe Arg Asn Tyr  
 20 25 30

Asp Ile Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Arg Ile Ser Gly His Tyr Gly Asn Thr Asp His Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Phe Thr Met Thr Lys Asp Thr Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Glu Leu Arg Ser Leu Thr Phe Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Ser Gln Trp Asn Val Asp Tyr Trp Gly Arg Gly Thr Leu Val  
 100 105 110

Thr Val Ser Ser  
115

<210> 121  
<211> 113  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region  
  
<400> 121

Asn Phe Met Leu Thr Gln Pro His Ser Val Ser Glu Ser Pro Gly Lys  
1 5 10 15

Thr Val Thr Ile Ser Cys Thr Arg Ser Ser Gly Ser Ile Ala Ser Asn  
20 25 30

Tyr Val Gln Trp Tyr Gln Gln Arg Pro Gly Ser Ser Pro Thr Thr Val  
35 40 45

Ile Phe Glu Asp Asn Arg Arg Pro Ser Gly Val Pro Asp Arg Phe Ser  
50 55 60

Gly Ser Ile Asp Thr Ser Ser Asn Ser Ala Ser Leu Thr Ile Ser Gly  
65 70 75 80

Leu Lys Thr Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Phe Asp Ser  
85 90 95

Thr Asn Leu Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly  
100 105 110

Ala

<210> 122  
<211> 121  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region  
  
<400> 122

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Asp Phe  
20 30

Ala Met His Trp Val Arg Gln Ile Pro Gly Lys Gly Leu Glu Trp Leu  
35 40 45

Ser Gly Leu Arg His Asp Gly Ser Thr Ala Tyr Tyr Ala Gly Ser Val  
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Arg Asn Thr Val Tyr  
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Thr Tyr Tyr Cys  
85 90 95

Val Thr Gly Ser Gly Ser Ser Gly Pro His Ala Phe Pro Val Trp Gly  
100 105 110

Lys Gly Thr Leu Val Thr Val Ser Ser  
115 120

<210> 123  
<211> 112  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 123

Ser Tyr Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln  
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Asn Ser Asn Ile Gly Thr Tyr  
20 25 30

Thr Val Asn Trp Phe Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu  
35 40 45

Ile Tyr Ser Asn Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser  
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln  
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu  
85 90 95

Asn Gly Pro Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly Ala  
100 105 110

<210> 124  
<211> 127  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 124

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Ser Ala Ile Ser Gly Ser Gly Gly Ser Thr Tyr Tyr Ala Asp Ser Val  
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr  
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Lys Gly Met Gly Tyr Tyr Gly Ser Gly Gly Tyr Tyr Pro Asp Asp  
100 105 110

Ala Phe Asp Val Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
115 120 125

<210> 125  
<211> 110  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 125

Ser Ser Glu Leu Thr Gln Asp Pro Asp Val Ser Met Ala Leu Gly Gln  
 1 5 10 15

Thr Val Thr Ile Ser Cys Arg Gly Asp Ser Leu Lys Arg Phe Tyr Ala  
 20 25 30

Ser Trp Tyr His Gln Lys Pro Gly Gln Ala Pro Val Leu Val Phe Tyr  
 35 40 45

Gly Lys Glu Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
 50 55 60

Asp Ser Gly Asp Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
 65 70 75 80

Asp Glu Gly Asp Tyr Tyr Cys His Thr Gln Asp Thr Ser Ala Arg Gln  
 85 90 95

Tyr Val Phe Gly Ser Gly Thr Lys Val Thr Val Leu Gly Ala  
 100 105 110

<210> 126  
 <211> 125  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region  
 <400> 126

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
100 105 110

Asp Ser Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ser  
115 120 125

<210> 127  
<211> 110  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 127

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Asn Tyr Tyr Ala  
20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Met Phe  
35 40 45

Gly Lys Asn Asn Arg Pro Ser Glu Ile Pro Gly Arg Phe Ser Gly Ser  
50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Arg Asn Ser His Gln  
85 90 95

Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala  
100 105 110

<210> 128  
<211> 121  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 128



Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
 1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
 20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
 35 40 45

Ser Ala Ile Ser Gly Ser Gly Gly Ser Thr Tyr Tyr Ala Asp Ser Val  
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr  
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Ser Ser Pro Tyr Ser Ser Arg Trp Tyr Ser Phe Asp Pro Trp Gly  
 100 105 110

Gln Gly Thr Met Val Thr Val Ser Ser  
 115 120

<210> 129  
 <211> 108  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region  
 <400> 129

Ser Tyr Glu Leu Thr Gln Pro Pro Ser Val Ser Val Ser Pro Gly Gln  
 1 5 10 15

Thr Ala Thr Ile Thr Cys Ser Gly Asp Asp Leu Gly Asn Lys Tyr Val  
 20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Val Leu Val Ile Tyr  
 35 40 45

Gln Asp Thr Lys Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser  
 50 55 60

Asn Ser Gly Asn Ile Ala Thr Leu Thr Ile Ser Gly Thr Gln Ala Val  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Gln Val Trp Asp Thr Gly Thr Val Val  
85 90 95

Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala  
100 105

<210> 130  
<211> 125  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 130

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
100 105 110

Asp Ser Trp Gly Lys Gly Thr Leu Val Thr Val Ser Ser  
115 120 125

<210> 131  
<211> 111  
<212> PRT  
<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 131

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala  
20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr  
35 40 45

Gly Lys Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His  
85 90 95

His Trp Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly Ala  
100 105 110

<210> 132

<211> 119

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 132

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser His  
20 25 30

Thr Met Asn Trp Val Arg Gln Ala Gln Gly Lys Gly Leu Glu Trp Val  
35 40 45

Ser Ser Ile Ser Gly Ser Gly Arg Tyr Ile Tyr Tyr Ser Asp Ser Val  
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Ala Ala Lys Asn Ser Leu Tyr  
65 70 75 80

Leu Gln Met Asn Asn Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Thr Arg Ala Lys Phe Gly Asp Tyr Leu Phe Asp Ser Trp Gly Gln Gly  
100 105 110

Thr Leu Val Thr Val Ser Ser  
115

<210> 133

<211> 112

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 133

Asn Phe Met Leu Thr Gln Pro His Ser Val Ser Gln Ser Pro Gly Lys  
1 5 10 15

Thr Val Thr Ile Ser Cys Thr Arg Ser Ser Gly Arg Ile Ala Ser Asn  
20 25 30

Phe Val Gln Trp Tyr Gln Gln Arg Pro Gly Ser Ala Pro Thr Thr Val  
35 40 45

Ile Tyr Glu Asp Asn Arg Arg Pro Ser Gly Val Pro Asp Arg Phe Ser  
50 55 60

Gly Ser Ile Asp Ser Ser Ser Asn Ser Ala Ser Leu Thr Ile Ser Gly  
65 70 75 80

Leu Lys Thr Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Asp Ala  
85 90 95

Arg Tyr Gln Val Phe Gly Thr Gly Thr Lys Val Thr Val Leu Gly Ala  
100 105 110

<210> 134

<211> 122

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 134

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Ser Ala Ile Ser Gly Ser Gly Gly Ser Thr Tyr Tyr Ala Asp Ser Val  
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr  
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Ser Pro Val Pro Pro Trp Ala Asp Trp Tyr Tyr Phe Asp Tyr Trp  
100 105 110

Gly Arg Gly Thr Met Val Thr Val Ser Ser  
115 120

<210> 135

<211> 113

<212> PRT

<213> artificial

<220>

<223> phage display generated VH or VL region

<400> 135

Gln Ala Val Leu Thr Gln Pro Ser Ser Val Ser Gly Ala Pro Gly Gln  
1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Arg Ser Asn Phe Gly Ala Gly  
20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Phe Pro Gly Thr Ala Pro Lys Leu  
35 40 45

Leu Ile Tyr Gly Asn Thr Asn Arg Pro Ser Gly Val Pro Asp Arg Phe  
50 55 60

Ser Gly Ser Arg Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu  
65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Asp Ser Asn  
85 90 95

Leu Ser Gly Ser Val Phe Gly Gly Gly Thr Lys Val Thr Val Leu Gly  
100 105 110

Ala

<210> 136  
<211> 125  
<212> PRT  
<213> artificial

<220>  
<223> phage display generated VH or VL region

<400> 136

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
100 105 110

Asp Ser Trp Gly Lys Gly Thr Leu Val Thr Val Ser Ser

115 120 125

<210> 137  
 <211> 111  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 137

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
 1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Asn Tyr Tyr Ala  
 20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Leu Tyr  
 35 40 45

Ser Lys Asn Ser Arg Pro Ser Gly Val Pro Asp Arg Phe Ser Gly Ser  
 50 55 60

Ser Ser Gly Thr Thr Ala Ser Leu Thr Ile Ser Gly Ala Gln Ala Glu  
 65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Thr Ser Gly Asp Leu  
 85 90 95

Arg Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala  
 100 105 110

<210> 138  
 <211> 125  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 138

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe  
 100 105 110

Asp Ser Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
 115 120 125

<210> 139  
 <211> 110  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 139

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
 1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Asn Tyr Tyr Ala  
 20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Met Phe  
 35 40 45

Gly Lys Asn Asn Arg Pro Ser Glu Ile Pro Gly Arg Phe Ser Gly Ser  
 50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
 65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Asn Ser His Gln  
 85 90 95

Trp Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ala



100

105

110

<210> 140  
 <211> 125  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 140

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Ser Asp Lys Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Ile Tyr Tyr Cys  
 85 90 95

Ala Arg Glu Ile Phe Ser His Cys Ser Gly Gly Ser Cys Tyr Pro Phe  
 100 105 110

Asp Tyr Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
 115 120 125

<210> 141  
 <211> 112  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 141

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
 1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala  
 20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Leu Leu Val Ile Tyr  
 35 40 45

Gly Arg Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
 50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
 65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Thr Asn His  
 85 90 95

Gly Asn Trp Val Phe Gly Gly Gly Thr Gln Leu Thr Val Leu Ser Ala  
 100 105 110

<210> 142  
 <211> 125  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region  
 <400> 142

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
 1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Ser Phe Thr Asn Tyr  
 20 25 30

Gly Leu Asn Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
 35 40 45

Gly Trp Ile Ser Pro Tyr Thr Gly Tyr Thr Asn Tyr Ala Gln Lys Phe  
 50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Lys Ser Thr Ser Thr Ala Tyr  
 65 70 75 80

Met Asp Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Glu Ile Phe Ser His Cys Thr Gly Gly Ser Cys Tyr Pro Phe

100

105

110

Asp Ser Trp Gly Arg Gly Thr Met Val Thr Val Ser Ser  
 115 120 125

<210> 143  
 <211> 111  
 <212> PRT  
 <213> artificial

<220>  
 <223> phage display generated VH or VL region

<400> 143

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
 1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala  
 20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr  
 35 40 45

Gly Lys Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
 50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
 65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn Leu  
 85 90 95

Asn Trp Val Phe Gly Gly Gly Thr Gln Leu Thr Val Leu Ser Ala  
 100 105 110

<210> 144  
 <211> 109  
 <212> PRT  
 <213> homo sapiens

<400> 144

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15

Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95

Ala Arg Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
 100 105

<210> 145  
 <211> 109  
 <212> PRT  
 <213> homo sapiens

<400> 145

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
 1 5 10 15

Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr  
 20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
 35 40 45

Gly Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
 50 55 60

Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser Thr Ala Tyr  
 65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
 85 90 95

Ala Arg Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ser  
 100 105

<210> 146  
 <211> 109  
 <212> PRT

<213> homo sapiens

<400> 146

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Glu  
1 5 10 15

Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe Thr Ser Tyr  
20 25 30

Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu Glu Trp Met  
35 40 45

Gly Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe  
50 55 60

Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser Thr Ala Tyr  
65 70 75 80

Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met Tyr Tyr Cys  
85 90 95

Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
100 105

<210> 147

<211> 109

<212> PRT

<213> homo sapiens

<400> 147

Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala  
1 5 10 15

Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr  
20 25 30

Gly Ile Ser Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met  
35 40 45

Gly Trp Ile Ser Ala Tyr Asn Gly Asn Thr Asn Tyr Ala Gln Lys Leu  
50 55 60

Gln Gly Arg Val Thr Met Thr Thr Asp Thr Ser Thr Ser Thr Ala Tyr  
65 70 75 80

Met Glu Leu Arg Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ser  
100 105

<210> 148  
<211> 109  
<212> PRT  
<213> homo sapiens

<400> 148

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
20 25 30

Gly Met His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
35 40 45

Ala Val Ile Trp Tyr Asp Gly Ser Asn Lys Tyr Tyr Ala Asp Ser Val  
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr  
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
85 90 95

Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
100 105

<210> 149  
<211> 109  
<212> PRT  
<213> homo sapiens

<400> 149

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val

35

40

45

Ser Ala Ile Ser Gly Ser Gly Gly Ser Thr Tyr Tyr Ala Asp Ser Val  
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr  
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Lys Trp Gly Gln Gly Thr Met Val Thr Val Ser Ser  
 100 105

<210> 150

<211> 109

<212> PRT

<213> homo sapiens

<400> 150

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly  
 1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr  
 20 25 30

Ser Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
 35 40 45

Ser Ser Ile Ser Ser Ser Ser Ser Tyr Ile Tyr Tyr Ala Asp Ser Val  
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr  
 65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
 85 90 95

Ala Arg Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser  
 100 105

<210> 151

<211> 108

<212> PRT

<213> homo sapiens

<400> 151

|

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala  
20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr  
35 40 45

Gly Lys Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His  
85 90 95

Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu  
100 105

<210> 152

<211> 111

<212> PRT

<213> homo sapiens

<400> 152

Asn Phe Met Leu Thr Gln Pro His Ser Val Ser Glu Ser Pro Gly Lys  
1 5 10 15

Thr Val Thr Ile Ser Cys Thr Arg Ser Ser Gly Ser Ile Ala Ser Asn  
20 25 30

Tyr Val Gln Trp Tyr Gln Gln Arg Pro Gly Ser Ser Pro Thr Thr Val  
35 40 45

Ile Tyr Glu Asp Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser  
50 55 60

Gly Ser Ile Asp Ser Ser Ser Asn Ser Ala Ser Leu Thr Ile Ser Gly  
65 70 75 80

Leu Lys Thr Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Asp Ser  
85 90 95



Ser Asn Leu Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu  
 100 105 110

<210> 153  
 <211> 108  
 <212> PRT  
 <213> homo sapiens

<400> 153

Ser Ser Glu Leu Thr Gln Asp Pro Ala Val Ser Val Ala Leu Gly Gln  
 1 5 10 15

Thr Val Arg Ile Thr Cys Gln Gly Asp Ser Leu Arg Ser Tyr Tyr Ala  
 20 25 30

Ser Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Leu Val Ile Tyr  
 35 40 45

Gly Lys Asn Asn Arg Pro Ser Gly Ile Pro Asp Arg Phe Ser Gly Ser  
 50 55 60

Ser Ser Gly Asn Thr Ala Ser Leu Thr Ile Thr Gly Ala Gln Ala Glu  
 65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Asn Ser Arg Asp Ser Ser Gly Asn His  
 85 90 95

Val Val Phe Gly Thr Gly Thr Lys Val Thr Val Leu  
 100 105

<210> 154  
 <211> 110  
 <212> PRT  
 <213> homo sapiens

<400> 154

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln  
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn  
 20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu  
 35 40 45

Ile Tyr Ser Asn Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser  
 50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln  
 65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu  
 85 90 95

Asn Gly Pro Val Phe Gly Thr Gly Thr Lys Val Thr Val Leu  
 100 105 110

<210> 155  
 <211> 105  
 <212> PRT  
 <213> homo sapiens

<400> 155

Ser Tyr Glu Leu Thr Gln Pro Pro Ser Val Ser Val Ser Pro Gly Gln  
 1 5 10 15

Thr Ala Ser Ile Thr Cys Ser Gly Asp Lys Leu Gly Asp Lys Tyr Ala  
 20 25 30

Cys Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Val Leu Val Ile Tyr  
 35 40 45

Gln Asp Ser Lys Arg Pro Ser Gly Ile Pro Glu Arg Phe Ser Gly Ser  
 50 55 60

Asn Ser Gly Asn Thr Ala Thr Leu Thr Ile Ser Gly Thr Gln Ala Met  
 65 70 75 80

Asp Glu Ala Asp Tyr Tyr Cys Gln Ala Trp Asp Ser Ser Thr Ala Phe  
 85 90 95

Gly Gly Gly Thr Lys Leu Thr Val Leu  
 100 105

<210> 156  
 <211> 108  
 <212> PRT  
 <213> homo sapiens

<400> 156

Asn Phe Met Leu Thr Gln Pro His Ser Val Ser Glu Ser Pro Gly Lys  
 1 5 10 15

Thr Val Thr Ile Ser Cys Thr Arg Ser Ser Gly Ser Ile Ala Ser Asn  
 20 25 30

Tyr Val Gln Trp Tyr Gln Gln Arg Pro Gly Ser Ser Pro Thr Thr Val  
 35 40 45

Ile Tyr Glu Asp Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser  
 50 55 60

Gly Ser Ile Asp Ser Ser Ser Asn Ser Ala Ser Leu Thr Ile Ser Gly  
 65 70 75 80

Leu Lys Thr Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Asp Ser  
 85 90 95

Ser Asn Phe Gly Thr Gly Thr Lys Val Thr Val Leu  
 100 105

<210> 157  
 <211> 109  
 <212> PRT  
 <213> homo sapiens

<400> 157

Gln Ser Val Val Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln  
 1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly  
 20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu  
 35 40 45

Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe  
 50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu  
 65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Asp Ser Ser  
 85 90 95

Leu Ser Gly Phe Gly Thr Gly Thr Lys Val Thr Val Leu  
100 105